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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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TOWNSEND AND TOWNSEND AND CREW, LLP
TWO EMBARCADERO CENTER
EIGHTH FLOOR
SAN FRANCISCO, CA 94111-3834

EXAMINER	
BAREFORD, KATHERINE A	

ART UNIT	PAPER NUMBER
1792	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/509,850	BARBEZAT ET AL.	
	Examiner	Art Unit	
	Katherine A. Bareford	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 December 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *43-62* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *43-62* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The amendment filed December 19, 2008 has been received and entered. With the amendment, claims 1-42 are canceled, and new claims 43-62 are pending for examination.

Specification

2. The substitute specification filed December 19, 2008 has not been entered because it does not conform to 37 CFR 1.125(b) and (c) because:

The substitute specification contains new matter. At paragraph [0006] the reference to "Low-density" transitional zones is new matter. This does not correspond to the previously described "low material" transitional zones (which as previously noted was confusing as to what the term meant).

3. The disclosure is objected to because of the following informalities: (1) at page 3, line 13; and page 4, lines 6 and 9; applicant needs to remove references to the claims. (2) headings, such as BRIEF DESCRIPTION OF THE DRAWINGS, SUMMARY OF THE INVENITON, etc. should be provided where appropriate in the specification.

Appropriate correction is required.

This objection remains because as discussed in paragraph 3 above, the substitute specification of December 19, 2008 has not been entered.

4. As to paragraphs 2-3 above, applicant has provided arguments in the amendment of December 19, 2008. Applicant argues that "low-material transitional zone" should be understood as "low-density transitional zone", referring to the original specification at page 2, lines 14-16; and also argues that a proper translation of the related German text of the PCT application may be translated as "low density transitional zones delimit the particles from one another". The Examiner has reviewed these arguments, however, the objection is maintained. The reference at page 2 is to a prior art coating and it is not described that the same features occur in the claimed coating. Furthermore, as to the translation of the PCT application, no showing has been made to this issue.

Claim Objections

5. The objection to claim 13 under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim is withdrawn due to the December 19, 2008 cancellation of claim 13.

6. Claim 43 is objected to because of the following informalities: in claim 43, line 5, "LPPS" should be spelled out to clarify what is referred to.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. The rejection of claims 12-24 and 28-42 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement is withdrawn due to the December 19, 2008 cancellation of these claims.

Double Patenting

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 43-62 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-21 of U.S. Patent No. 7,482,035 (patent issued from 10/835,358) in view of Muehlberger (US 5853815). Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of US 7,482,035 provide overlapping requirements as to the claims including the injection of coating material into a plasma, partial or complete evaporation of the coating material, and the controlling of process parameters. While the claims of US 7,482,035 does not teach the substrate material, layer features and low pressure plasma features, Muehlberger teaches that a conventional system for plasma production for coating is a low pressure plasma spraying system for coating metallic substrates with a pressure of desirably 0.001 to 10 Torr (0.133 to 1333 Pa). Column 7, lines 20-50 and column 8, lines 50-55. The plasma gas can include Ar/He mixtures. Column 10, lines 20-30. The gas flow can be 267 SCFH or 126 SLPM. Column 10, lines 20-30. The powder delivery can be 2.61 lbs/hr or 19.71 g/min. Column 10, lines 50-55. The coating can be from multiple layers. Column 10, lines 55-65. The coating can be 0.0011 inch thick (approx. 27 microns). Column 11, lines 1-5. The particle size can be 5-8 microns. Column 10, lines 50-55. It would have been obvious to one of ordinary skill in the art to modify US 7,482,035 to use the low pressure plasma system and features as suggested by Muehlberger to provide the plasma with an expectation of desirable results, because US 7,482,035 teaches treating performing a coating and evaporation process where particles can be injected into a plasma, and Muehlberger teaches a conventional plasma

system for coating. As to the multilayers and heat insulation and bond coat layers, the Examiner notes that US 7,482,035 teaches at claims 9-11 the use of materials well known in the art as bond coat and heat insulation materials and also teaches substrates of turbine vanes (claim 20) and furthermore it is the Examiner's position that it is well known in the art to apply such materials to gas turbine components.

11. Applicant argues in the amendment of December 19, 2008 that as to the provisional obviousness-type double patenting rejection that a timely filed terminal disclaimer may be used to overcome the provisional rejection and that they are prepared to file a terminal disclaimer should the need arise when one or the other of the applications has allowed claims.

The Examiner provides the rejection, now based on US 7,482,035, which has issued from 10/835,358 because, while a terminal disclaimer was referred to, one has not yet been filed, and new claims 43-62 are still covered by the claims of US 7,482,035.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claims 43-47 and 50-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 96/06200 (hereinafter '200).

Claim 43: '200 teaches a method of forming a coating on a substrate using a low pressure plasma spray, using a coating in the form of a powder beam for spraying onto a surface of a substrate. Figure 1 and pages 6-10. The coating would be inherently heat (thermally) insulating as a ceramic oxide layer would be applied over the substrate, which would provide at least some degree of insulation of the substrate. Page 19 (claims 12-13). The substrate is metallic. Page 12 (example 1, aluminum alloy). The plasma spray is operated to produce a plasma stream which delivers the coating material to the substrate. Figure 1 and page 10. The operating includes introducing plasma gas into a plasma gun to establish plasma gas operating conditions. Page 9. '200 does not specifically teach that at least 5 wt% of the particles are evaporated with part melting, or

that conditions are controlled to provide an anisotropic columnar microstructure with elongate particles aligned substantially perpendicularly to the substrate surface and transition regions with little material delimiting the particles relative to each other, however, '200 provides coating materials and conditions that overlap with that taught by applicant to provide such results. Therefore, it would be inherent that the enthalpy, vaporization, part melting and anisotropic structure would occur, or at least occur when the taught process conditions are optimized from the given ranges. For example, '200 teaches that the powder can be a ceramic oxide. Page 19 (claims 12-13). The powder conveying rate can be 30 g/min (within the ranges of claims 46-47). Page 9. The process pressure can be 399.96 to 666.6 Pa (within the ranges of claims 43-44). Page 8. The gas flow rate can be of a mixture of inert gases having a total flow rate of 54 SLPM, for example(- 30 SLPM argon and 24 SLPM helium), and the volume ratio can be in the range of 2:1 to 1:4 (as in claims 43,45). Page 9. The power can be anything greater than 40 kW (as in claim 43). Page 8 (and In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976), and it would be able to be empirically determined as the power has to be set to the desired amount). The particle size can be 3-10 microns. Page 9.

Claim 44: The process pressure can be 399.96 to 666.6 Pa. Page 8.

Claim 45: The gas flow rate can be of a mixture of inert gases having a total flow rate of 54 SLPM, for example(– 30 SLPM argon and 24 SLPM helium), and the volume ratio can be in the range of 2:1 to 1:4. Page 9.

Claims 46-47: The powder conveying rate can be 30 g/min. Page 9.

Claims 50-51: '200 provides a moving plasma defocused beam. Pages 6-7 and figure 1. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '200 to provide that the substrate is moved with rotational or pivotable movements relative to the plasma beam with an expectation of desirable coating results, because '200 provides movement of the substrate and plasma beam and this relative movement would provide the same conditions as if the substrate is moved rotationally or pivotably.

15. Claims 43-47, 50-51 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muehlberger (US 5853815) in view of WO 96/06200 (hereinafter '200).

Claim 43: Muehlberger teaches a plasma spray system for forming coatings of metallic oxides or other materials on metallic substrates. Column 1, lines 10-15. The coating would be inherently heat (thermally) insulating as a ceramic oxide layer would be applied over the substrate, which would provide at least some degree of insulation of the substrate. Column 10, line 50 through column 11, line 5. The system provides for low pressure plasma spraying where powder beam source is mixed with and becomes

entrained with the plasma stream. Column 7, lines 20-30 and column 8, lines 30-55. Muehlberger does not specifically teach that at least 5 wt% of the particles are evaporated with part melting, or that conditions are controlled to provide an anisotropic columnar microstructure with elongate particles aligned substantially perpendicularly to the substrate surface and transition regions with little material delimiting the particles relative to each other, however, '200 provides coating materials and conditions that overlap with that taught by applicant to provide such results. In such a system, a pressure of desirably 0.001 to 10 Torr (0.133 to 1333 Pa) is used. Column 7, lines 20-50 and column 8, lines 50-55. The pressure can be 666.6 Pa (5 Torr), for example. Column 10, lines 30-32. The power used can be up to 100 kW, including 84.6 kW. Column 10, lines 15-30. The plasma gas can include Ar/He mixtures. Column 10, lines 20-30. The gas flow can be 267 SCFH or 126 SLPM. Column 10, lines 20-30. The powder delivery can be 2.61 lbs/hr or 19.71 g/min. Column 10, lines 50-55. The coating can be from multiple layers. Column 10, lines 55-65. The coating can be 0.0011 inch thick (approx. 27 microns). Column 11, lines 1-5. The particle size can be 5-8 microns. Column 10, lines 50-55.

Claim 44: the pressure can be 666.6 Pa (5 Torr). Column 10, lines 30-32.

Claim 45: the mixture of inert gases used for the process gas can be argon and helium. Column 10, lines 20-30.

Claims 46-47: the powder delivery can be 19.71 g/in (2.61 lbs/hr). Column 10, lines 50-55.

Claim 50-51: a moving plasma beam is provided. Column 10, lines 1-20. The substrate can also be moved. Figure 5 and column 12, lines 55-60.

Claim 55: An additional heat source can be provided to preheat the particles to a predetermined temperature before injecting. Column 9, lines 15-30.

Muehlberger teaches all the features of these claims except the exact power (claim 43) and gas mixture ratio (claim 45); the substrate movement features (claims 50-51) and the heat source features (claim 55).

However, '200 teaches a method of forming a coating on a substrate using a low pressure plasma spray, using a coating in the form of a powder beam for spraying onto a surface of a substrate. Figure 1 and pages 6-10. The coating would be inherently heat (thermally) insulating as a ceramic oxide layer would be applied over the substrate, which would provide at least some degree of insulation of the substrate. Page 19 (claims 12-13). The substrate is metallic. Page 12 (example 1, aluminum alloy). The plasma spray is operated to produce a plasma stream which delivers the coating material to the substrate. Figure 1 and page 10. The operating includes introducing plasma gas into a plasma gun to establish plasma gas operating conditions. Page 9. '200 does not specifically teach that at least 5 wt% of the particles are evaporated with part melting, or that conditions are controlled to provide an anisotropic columnar microstructure with elongate particles aligned substantially perpendicularly to the substrate surface and transition regions with little material delimiting the particles relative to each other, however, '200 provides coating materials and conditions that overlap with that taught

by applicant to provide such results. For example, '200 teaches that the powder can be a ceramic oxide. Page 19 (claims 12-13). The powder conveying rate can be 30 g/min (within the ranges of claims 46-47). Page 9. The process pressure can be 399.96 to 666.6 Pa (within the ranges of claims 43-44). Page 8. The gas flow rate can be of a mixture of inert gases having a total flow rate of 54 SLPM, for example(– 30 SLPM argon and 24 SLPM helium), and the volume ratio can be in the range of 2:1 to 1:4 (as in claims 43,45). Page 9. The power can be anything greater than 40 kW (as in claim 43). Page 8 (and In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); and it would be able to be empirically determined as the power has to be set to the desired amount). The particle size can be 3-10 microns. Page 9.

It is further the Examiner's position that it is well known in the thermal spraying art for to provide independent cooling or heating of a substrate to provide the optimum temperature for thermal spraying. If applicant disagrees, he should so respond on the record.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Muehlberger to use a power and gas mixture ratio in the claimed range as suggested by '200 in order to provide an optimized spray set up, as Muehlberger teaches using a low pressure plasma spray system for application of a ceramic oxide on a metallic substrate and '200 teaches that gas mixture ratio of argon/helium used can desirably be within the claimed range and that power can

desirably be anything greater than 40 kW, and In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). As a result, although Muehlberger and '200 do not specifically teach that at least 5 wt% of the particles are evaporated with part melting, or that conditions are controlled to provide an anisotropic columnar microstructure with elongate particles aligned substantially perpendicularly to the substrate surface and transition regions with little material delimiting the particles relative to each other, however, the combination of references provides coating materials and conditions that overlap with that taught by applicant to provide such results, and therefore, it would be inherent that the enthalpy, vaporization, part melting and anisotropic structure would occur, or at least occur when the taught process conditions are optimized from the given ranges. As to the substrate movement, it would have been obvious to modify Muehlberger in view of '200 to provide that the substrate is moved with rotational or pivotable movements relative to the plasma beam with an expectation of desirable coating results, because Muehlberger and '200 provide movement of the substrate and plasma beam and this relative movement would provide the same conditions as if the substrate is moved rotationally or pivotably. As to the heat source, it would have been obvious to modify Muehlberger in view of '200 to provide that the heat source is controlled or regulated independently of the process pressure, gas flow rate and plasma enthalpy with an expectation of desirable coating results, because Muehlberger provides using a heat

source to preheat the particles before introduction to a desired temperature, and this is a separate heating process that would occur independently of conditions in the chamber. As well, it would have been obvious to also provide independent control of the substrate temperature, as it is well known in the art to provide temperature control of a substrate by means of a cooling or heating device, for example.

16. Claims 48, 49, 52-54 and 56-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muehlberger in view of '200 as applied to claims 43-47, 50-51 and 55 above, and further in view of Zheng (US 5817372).

Muehlberger in view of '200 teaches all the features of these claims except the gas turbine substrate (claims 48, 49, 60-62), the stabilized zirconia powder (claim 52), the laser scattering to determine particle size (claims 53, 54), the spray drying to make the particles (claims 53, 54), the thermally insulating layer system with base layer, yttria stabilized zirconia layer and cover layer applied in a single working cycle (claims 56, 57), the substrate material (claim 58), post heat treating (claim 59). Muehlberger does provide that the coating can be from multiple layers (column 10, lines 55-65), the coating can be 0.0011 inch thick (approx. 27 microns) (column 11, lines 1-5), and the particle size can be 5-8 microns (column 10, lines 50-55).

However, Zheng teaches that it is desired to apply a thermal barrier (heat insulating) coating system using a low pressure plasma spray process (vacuum plasma spray). Column 4, lines 5-50. The system includes a substrate that can be a turbine

blade or other component of a gas turbine engine. Column 3, line 60 through column 4, line 10. The substrate can be a nickel or cobalt base alloy. Column 4, lines 5-15. The substrate can have a lower bond coating also applied by low pressure plasma spray. Column 4, lines 45-50. The bond coating can be Me Cr Al Y, with Me being Fe, Co or Ni. Column 4, lines 35-40. The applied system can be heat treated. Column 6, lines 25-40. The ceramic coating can be yttria (the oxide form of yttrium) stabilized zirconia. Column 4, lines 10-20.

It is the Examiner's position that it is well known to determine size distribution of powder particles using a laser scattering or scanning method. It is also the Examiner's position that it is well known to make thermal spraying powders by a spray drying method. As applicant has not traversed these positions from the Office Action of August 29, 2006, they are understood to be admitted prior art as per MPEP 2144.03(C).

It is further the Examiner's position that it is well known in the thermal spraying art for the bond coating of a thermal barrier coating to be 25-150 microns thick. As applicant has not traversed this position from the Office Action of August 29, 2006, they are understood to be admitted prior art as per MPEP 2144.03(C).

It is further the Examiner's position that it is well known in the gas turbine art that gas turbines commonly are used in stationary engines or in aircraft engines, and that such turbines commonly have turbine blades, rotor vanes, rotor blades heat shields

or other components acted on by hot gas. If applicant disagrees, he should so respond on the record.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Muehlberger in view of '200 to apply a thermal barrier coating including a bond coating (MeCrAlY) and yttria stabilized zirconia coating and cover layer to a turbine blade or other gas turbine component with a nickel or cobalt base alloy substrate and then to heat treat the system as suggested by Zheng in order to provide a desirable coating system as Muehlberger teaches using a low pressure plasma spray system for ceramics in general and Zheng teaches that it is desirable to use low pressure plasma spray to provide a thermal barrier coating system including a bond coating and yttria stabilized zirconia coating to a turbine blade with a nickel or cobalt base alloy substrate and then to heat treat the system; since Muehlberger teaches providing the coating as multiple layers, one or more layers of zirconia can be considered to provide the thermally insulating zirconia layer as claimed and further one or more of the layers of zirconia provided can be considered the "cover layer" of the same material with optimized individual layer thicknesses to provide the total thickness provided by Zheng (column 6, lines 25-30). It further would have been obvious to modify Muehlberger in view of '200 and Zheng to perform the coating of the layers in a single work cycle to provide efficient coating because all layers are applied by low pressure plasma spray. It would also have been obvious to modify Muehlberger in view of '200 and Zheng to provide the bond coating thickness in the

range of 25 to 150 microns with an expectation of desirable coating results because bond coats are conventionally of that thickness. It would also have been obvious to modify Muehlberger in view of '200 and Zheng to check the size of the particles using a laser scanning or scattering method in order to confirm that the desired size was present as it is well known to determine size distribution by such a method and a specific range of particle sizes is desired, and to use powders made by a spray drying method as this is a well known method in the art to make powders for thermal spraying. It would also have been obvious to modify Muehlberger in view of '200 and Zheng to provide that the substrate is a turbine blade of a stationary gas turbine engine or of an aircraft engine, that the substrate is a guide vane or rotator blade or a component acted on by hot gas, or a heat shield in an aircraft engine, with an expectation of desirable protective coating result, as Zheng teaches to coat gas turbine engine components, which would conventionally include a turbine blade of a stationary gas turbine engine or of an aircraft engine, a guide vane or rotator blade or a component acted on by hot gas, or a heat shield in an aircraft engine.

17. The Examiner notes that WO 96/06200 was provided in applicant's Sept. 30, 2004 IDS.

Response to Arguments

18. Applicant's arguments with respect to claims 43-62 have been considered but are moot in view of the new ground(s) of rejection.

Due to the new claims with their new requirements the above new rejections have been provided. As to '200 providing a lithographic plate and not a thermally insulating layer on a general metallic substrate, the Examiner notes that as discussed above, the application of the ceramic layer will provide a least some thermal insulation. As to the combination of '200 and Muehlberger with Zheng, the Examiner notes that in the rejection above, the primary reference to Muehlberger is not limited to lithographic plates. As to the specific pressures, plasma power, etc. provided by '200 and Muehlberger, the Examiner notes examples provided in the ranges in the rejection above, and the overlap of taught ranges as noted in the rejection above; thus when optimizing the claimed resulting anisotropically structured coating with elongate particles would be provided. Applicant has not provided a showing of the unexpected benefits of the specific ranges used by applicant over the showing by the references. As to Zheng requiring a bond coat of HVOF application, the Examiner disagrees. Zheng explicitly teaches that the bond coat can be applied by VPS (vacuum plasma spray), otherwise known as LPPS (low pressure plasma spraying). Column 4, lines 44-50 and column 4, lines 15-20.

Conclusion

19. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Katherine A. Bareford/
Primary Examiner, Art Unit 1792